

## REMARKS/ARGUMENTS

Claims 29-33 are pending in the present application. Claims 29, 30, and 33 stand rejected under 35 U.S.C. §102 and claims 31 and 32 stand rejected under 35 U.S.C. §103 in the Final Office Action mailed on June 3, 2008. A Notice of Appeal, together with a three-month extension of time, was filed on November 25, 2008 and an Appeal Brief was filed on January 13, 2008. Thereafter, the Examiner's Answer setting forth a new ground of rejection of claims 29-33 under 35 U.S.C. §101 was mailed on March 6, 2009.

In view of the new ground of rejection in the Examiner's Answer, applicant respectfully requests that prosecution be reopened before the primary examiner under 37 C.F.R. § 41.39(b)(1). The new ground of rejection is traversed and reconsideration is requested in view of this reply which fully addresses the new ground of rejection.

### *Claim Amendments*

Independent method claims 29, 31, and 33 are amended to recite the particular tangibly embodied computer software application process executing on the particular physical computer hardware machine for each step of the methods of independent claims 29, 31, and 33. See, e.g., Application, pars. [0018], [0019], [0024], [0025], [0032]-[0047] and Figures 2, 3 and 5.

Support for the foregoing amendment is found throughout the specification and in the claims as detailed above. Accordingly, no new matter has been added.

### *Claim Rejections - 35 U.S.C. §101*

As a new ground of rejection set forth in the Examiner's Answer, claims 29-33 are rejected under 35 U.S.C. 101 as non-statutory by the examiner, citing *In re Bilski*. The rejection is traversed and reconsideration is requested.

The amendment of independent claim 1 renders the rejection of claims 29-33 under 35 U.S.C. 101 moot. Amended independent claims 29, 31, and 33, and claim 30 depending on claim 29 and claim 32 depending on claim 31, clearly -recite a process that employs one of the other statutory categories and therefore claim statutory subject matter under 35 U.S.C. 101. See, e.g., *Ex Parte Wasynczuk*, No. 2008-1496 (2 June 2008).

### *Claim Rejections - 35 U.S.C. 102(e)*

Independent claims 29 and 33 and claim 30 depending on claim 29 stand rejected under 35 U.S.C. 102(e) as anticipated by Shrader. The rejection is traversed and reconsideration is requested.

Shrader does not read on the claimed invention in at least the following respects.

Regarding independent claims 29 and 33:

- Initially, the Examiner asserts in the Final Office Action dated June 3, 2008, page 2, lines 13-21:

However, the examiner notes that the applicant's revisions fail to provide any specificity or clarity as to how or when a vote serial number is assigned/associated to/with a ballot (i.e. the specification provides no clear guidance as to how to interpret the claim "associating the Bcast and DS(Bcast,s) with a vote serial number VSN").

Therefore the examiner is interpreting the claim to encompass associating any unique identifier with a ballot either before or after the voter (user) casts his/her vote ("vote serial number", as defined by the specification,: "Note that the VSN...is ***just an incidental sequence number*** that indicates a vote was delivered in the election" (emphasis added, Paragraph 0054).

As described in the foregoing specification quotation cited by the Examiner, the VSN "indicates a ***vote delivered*** in the election." It follows from the past tense usage in the expression, "***vote delivered***", that the VSN cannot be assigned until after a vote is "***delivered***". Accordingly, the Examiner's alleged interpretation of the claims to encompass associating any unique identifier with a ballot either before or after the voter (user) casts his/her vote is a *per se* mischaracterization of the claim language.

- Based on the foregoing mischaracterization of the claim language, the Examiner further asserts in the Final Office Action dated June 3, 2008, page 3, lines 3-12:

Additionally it is noted that a pre-cast ballot (vote) having an associated vote serial number (e.g. ballot number) retains (remains associated with) the unique identifier even after the ballot has been cast (i.e. once the vote serial number has been assigned to the

vote/ballot it remains associated with the ballot before, during and after the user votes using the ballot).

Further it is noted that it is old and very well known in database systems to assign a unique identified (key, primary key, candidate key, unique key), either manually or automatically by the database management system, to all records in a database in fact databases would be unusable without a unique identified associated and assigned to each record as it is stored into the database.

While the use of information uniquely defining a particular database record to locate the stored database record is not disputed, the Examiner's additional allegations simply incorporate and compound the foregoing mischaracterization. For example, the Examiner's allegations regarding "*a pre-cast ballot (vote) having an associated vote serial number (e.g., ballot number)*" and "*vote serial number... assigned to the vote/ballot ... associated with the ballot before, during and after the user votes using the ballot*" are based on the foregoing mischaracterization of the claims by the Examiner to encompass associating any unique identifier with a ballot either before or after the voter (user) casts his/her vote which is belied by the past tense usage in the expression, "*vote delivered*" in the passage quoted by the Examiner in support of such mischaracterization.

- Shrader fails to teach or even suggest a method for assisting a *user* in verifying a *cast* ballot stored in a server, as recited in independent claim 29 and similarly in independent claim 33. Neither "*user*" nor "*cast*" is an optional portion of the claims as implied by the Examiner. Thus, if Shrader does not disclose assisting a "*user*" in verifying a "*cast*" ballot (i.e., a data item that includes actual votes), then Shrader does not anticipate the claims. The written description is clear that the user<sup>1</sup> initiates individual verification of a cast ballot (emphasis supplied):

[0057] Consider now the case where *an individual would want to connect to the system ... to determine if their cast ballot is properly recorded. In such a case, the individual can present vote confirmation, e.g., token 61, through a transmission 67 to the server 43 side. ...*

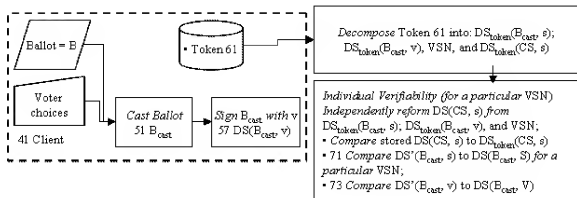
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<sup>1</sup> [0019] ... the terms "individual", "user", "client", and "voter" are used interchangeably, and refer to a person ...

[0058] The digital signature on that confirmation can then be recomputed, and it can be verified that the confirmation has not been altered. Having done so, the vote serial number can then be extracted from the confirmation, and the database can be indexed to allow **reconstruction of the voter's ballot exactly as cast**.

[0059] Descriptors 71 and 73 illustrate what is known as **individual verifiability** ...

Figure 5, a portion of which is shown here, also shows that *Cast Ballot* includes *Voter choices* and that the user (*Client*) initiates *Individual Verifiability* with a *Token*.



Of the Abstract, [0050]-[0053], [0060],[0063], and Figures 4-8 of Shrader alleged by the Examiner to disclose assisting a **user** verifying a **cast** ballot, only [0063] in Shrader discloses verification of any sort as hereinafter discussed – and in that case, it is verification **not** involving the **user** and explicitly **teaching against** using actual votes from the ballot, i.e., the **cast** ballot. Moreover, repeated, detailed examination of Shrader reveals no disclosure whatsoever directed to assisting a **user** in verifying the votes of a **cast** ballot.

- Shrader fails to disclose forming a digital signature of  $B_{cast}$  using a **private key of the server**  $DS(B_{cast}, s)$ , as recited in independent claims 29 and 33. The Examiner alleges that this limitation is disclosed in [0063] and Figures 7-8 element 72 of Shrader, specifically citing the underlined portion of the following passage:

[0063] ... The voting tabulator receives the encrypted voting information from the voting entity 69 and decrypts the encrypted voting information with the tabulator's own private key 70, to get the votes and the encrypted electronic ballot. ... The voting

tabulator signs, encrypts and sends the encrypted electronic ballot to the voting mediator 72 in a message that is encrypted with the voting mediator's public key and signed with the voting tabulator's private key.

However, according to the non-underlined portion of the above passage, “voting information” includes “votes” **and** “encrypted electronic ballot.” Shrader’s “encrypted electronic ballot” does not contain votes. In the present application,  $B_{\text{cast}}$  includes votes (see, e.g., Figure 5, *Voter choices*). It is clear that instead of forming a digital signature of  $B_{\text{cast}}$ , as recited in claims 29 and 33, Shrader simply forms a digital signature of the ballot,  $B$ . Further, in Shrader the digital signature of the ballot is encrypted with the public key of the mediator/server, i.e.,  $DS(B, S)$  in the notation of the application, not  $DS(B_{\text{cast}}, s)$  as recited in claims 29 and 33. Thus, Shrader discloses the wrong data encrypted with the wrong key.

- Shrader likewise fails to disclose **associating the  $B_{\text{cast}}$  and  $DS(B_{\text{cast}}, s)$  with a vote serial number  $VSN$** , as recited in independent claims 29 and 33. In alleging that this limitation is taught by Shrader, the Examiner again mischaracterizes the claim language as “associating (storing, linking, relating, etc.) the (cast) ballot, the voter’s digital signature of the ballot with a ballot number ....” On the contrary,  $DS(B_{\text{cast}}, s)$  is **not** the “voter’s digital signature of the ballot” – that would be  $DS(B, v)$  for the voter’s private key, or  $DS(B, V)$  for the voter’s public key. Instead,  $DS(B_{\text{cast}}, s)$  is the digital signature of  $B_{\text{cast}}$  (which includes actual votes) using a private key of the server. The specification clearly describes the notation used in the claims as follows:

[0052] Throughout this disclosure in labels such as  $DS(...,C)$  or  $DS(...,c)$ , an upper case letter in the second position means a public key, and a lower case letter means a secret or private key, ...

[0053] ... Specifically, the server’s signature of the cast ballot  $DS(B_{\text{cast}}, s)$  53.

Further,  $VSN$  is not the ballot number. While the specification notes that  $VSN$  can be *like* a ballot serial number, as previously noted herein, the specification clearly describes it as follows (emphasis added):

[0053] ... Note that the  $VSN$  ... is just an incidental sequence number that indicates **a vote delivered** in the election.

According to Shrader [0061], [0063], Figures 5-6 elements 57 and 58, and Figure 8 element 71, cited by the Examiner as disclosing associating the  $B_{\text{cast}}$  and  $DS(B_{\text{cast}}, s)$  with a vote serial number VSN, as recited in independent claims 29 and 33, the elements to be associated do not exist until after a voter's choices have been made; each element requires a voter choices; and voter choices do not exist in Shrader until [0062] and Figure 7. Thus, it is patently impossible for Shrader [0061], and Figures 5, 6 to disclose the yet-to-exist elements ( $B_{\text{cast}}$ ,  $DS(B_{\text{cast}}, s)$ , and VSN), which leaves only Shrader [0063] and Figures 7 and 8 to disclose the elements and their association. Those portions of Shrader address verification as follows (**bold** emphasis added to show where the reference not only fails to disclose the claim limitation, but also teaches away from it):

*[0063] ... The message that the tabulator sends to the mediator is a verification message. **The verification message does not contain the actual votes from the ballot**, since the voting must be anonymous. Instead, the verification message contains identifying ballot information such as the **ballot number**, to ensure that it was issued by the mediator and has not been previously used.*

Notice that Shrader teaches away from using “actual votes” in its verification message and instead uses a **ballot number** which exists **before** a vote instead of a **vote serial number** which applicant's claimed invention assigns **after** a vote (see, e.g., Application [0054] quoted above).

- Further, Shrader fails to teach forming a confirmation token, comprising  $DS(B_{\text{cast}}, s)$  and VSN, as recited in independent claim 29, again mischaracterizing the claim language as “forming a message (confirmation, string, receipt, acknowledgement, token, etc.) comprising a system's **digital signature of the ballot** and the **ballot number**.” First, claim 29 recites a digital signature of the cast ballot (i.e.,  $B_{\text{cast}}$ ) instead of the ballot B as mischaracterized by the Examiner. Second, claim 29 recites use of a VSN instead of a ballot number as mischaracterized by the Examiner. The differences contribute to distinguishing the claim from the reference. In addition to mischaracterizing the language of claim 29, the Examiner ignores the disclosure of Shrader [0063] that **excludes** vote (i.e., part of  $B_{\text{cast}}$ ) from the message:

*[0063] ... The verification message does not contain the actual votes from the ballot, since the voting must be anonymous. ...*

It is abundantly clear that Shrader does not form a confirmation token comprising a vote and vote serial number.

- Additionally, Shrader fails to disclose making the confirmation token available to a **user** and/or receiving a confirmation token made available to a **user**, as recited in independent claim 29. In fact, the Examiner simply ignores the fact that the confirmation token is to be made available to the user, alleging only that Shrader discloses “making the message available (verification message exchanged between tabulator to **mediator**; Paragraphs 0061, 0063, Figures 7-8)”. As noted above, Shrader does not form a confirmation token. Further, Shrader’s mediator, a **server process**, is **not** a **user** as defined in the present application:

*[0019] ... the terms “individual”, “user”, “client”, and “voter” are used interchangeably, and refer to a person ...*

- In addition, Shrader fails to teach the comparison and verification recited in independent claims 29 and 33. Specifically, Shrader fails to teach comparison between  $DS_{\text{received token}}(B_{\text{cast}}, s)$  (the received-token version of the digital signature over the cast ballot containing votes using the private key of the server) and one of  $DS(B_{\text{casts}}, s)$  (the digital signature over the cast ballot containing votes using the private key of the server as stored on the server), or  $DS(B_{\text{casts}}, S)$  (the digital signature over the cast ballot containing votes using the public key of the server as stored on the server). As previously noted, Shrader [0061]-[0063] and Figures 7, 8 alleged by the Examiner to teach the comparison and verification recited in independent claims 29 and 33, does not disclose any sort of verification until the middle of Shrader [0063]. There Shrader teaches checking to see if ballot number (not a VSN, and most assuredly not a data item including  $B_{\text{cast}}$ ) has already been used. This is **not** a comparison of digital signature over a data item containing the votes, which comparison is required by the claims.

Consequently, Shrader does not disclose nor even suggest the required combination of limitations of independent claims 29 and/or 33. Because each and every element as set forth in independent claims 29 and/or 33 is not found, either expressly or inherently in Shrader, the Examiner has failed to establish a *prima facie* case of unpatentability. See Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628 (Fed. Cir. 1987); see also MPEP §2131.

Regarding claim 30 depending on claim 29, the Examiner has failed to establish the required *prima facie* case of unpatentability for independent claim 29, and similarly has failed to establish a *prima facie* case of unpatentability of claim 30 depending on claim 29, and which recites further specific elements that have no reasonable correspondence to the reference in at least the following respects:

- Claim 30 depending on claim 29 recites the addition of elements to the *confirmation token* of claim 29 before it is made available to a user and after receiving the *confirmation token* from a user, extracting those additional elements, and thereafter verifying a cast ballot upon the additional condition that the additional elements of the *confirmation token* are equivalent to the version of those elements stored on the server for that VSN. The Examiner alleges that Shrader [0061]-[0063] and Figures 7, 8 discloses the further specific elements recited in claim 30:

*... the message (confirmation token, received token) further comprises the system's digital signature of the ballot and ballot number (aggregation; Paragraphs 0060-0062; Figure 2, Certificate No.)*

As repeatedly pointed out, the specific claim language requires the digital signature of a data item containing the cast ballot and the use of a vote serial number (VSN) instead of a ballot number. The claim language is again mischaracterized by the Examiner. As also pointed out, while the Examiner cites Shrader [0060]-[0062] and Figure 2 as disclosing the formation and use of a token used for verification, Shrader does not disclose any sort of verification until [0063]. Further, Figure 2 is an illustration of a paper voter registration "certificate" that is in no way whatsoever connected to verification of a cast ballot. The remainder of the claim 30 requires extracting information that Shrader does



not, from a token that Shrader does not form or receive, in order to provide individual verification (a function that Shrader does not provide).

### ***Claim Rejections - 35 U.S.C. 103(a)***

Independent claim 31 and claim 32 depending on claim 31 stand rejected under 35 U.S.C. 103(a) as obvious over Cranor and Shrader. The rejection is traversed and reconsideration is requested.

The proposed modification of Cranor in view of Shrader lacks one or more limitations recited in each of the claims, and there is inadequate articulated reasoning with rational underpinning to support the Examiner's legal conclusion of obviousness in at least the following respects:

- Regarding independent claim 31, similar to the rejection of independent claims 29 and 33, the Examiner continues to mischaracterize the claims, for example, by substituting "ballot" (e.g., a list of candidates for each position in an election) for "**cast ballot**" ( $B_{\text{cast}}$ , which includes voter's choices); by substituting "voter's identification number" and "ballot number" for "**vote serial number (VSN)**"; by substituting "entity, ... system, subsystem, third party" for "**user**;" and by neglecting to account for the inclusion of the digital signature of the cast ballot using the server's private key as an element of the association called for in Claim 31. There is no support for interpreting the claim language in this fashion. Both Shrader and Cranor clearly distinguish: **a)** between empty ballots and choices/votes/cast ballots; **b)** between voter ID numbers, uncast ballot numbers, and number assigned to actual votes; and **c)** between the system and users/voters. In fact, as mentioned above, Shrader even **teaches against** equating an empty ballot with a cast ballot. It is axiomatic that a *prima facie* case of obviousness cannot be made while neglecting to account for all the elements of the claim.

Consequently, the claimed combinations recited in independent claim 31 are not taught or suggested by Cranor and/or Shrader, either separately or in combination with one another. Because the cited references, either alone or in combination, do not teach the limitations of independent claim 31, the Examiner has failed to establish the required *prima facie* case of

unpatentability. See In re Royka, 490 F.2d 981, 985 (C.C.P.A., 1974) (holding that a *prima facie* case of obviousness requires the references to teach all of the limitations of the rejected claim); See also MPEP §2143.03.

Regarding claim 32 depending on claim 31, the Examiner has failed to establish the required *prima facie* case of unpatentability for independent claim 31, and similarly has failed to establish a *prima facie* case of unpatentability of claim 32 that depends on claim 31, and which recites further specific elements that have no reasonable correspondence to the references in at least the following respects:

- Claim 32 depending on independent claim 31 requires determining whether a confirmation token has been modified since its formation. The Examiner cites Cranor P05 para 02, P07 last para, and P08 para 1-4, none of which address determining whether a token has been modified.

### **Conclusion**

In view of the forgoing remarks/arguments, each of the claims in the application is believed to be in condition for immediate allowance. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection and to pass the application to issue. If the Examiner believes that the prosecution might be advanced by discussing the application with the undersigned representative, in person or over the telephone, we welcome the opportunity to do so. In addition, if any additional fees are required in connection with the filing of this response, the Commissioner is hereby authorized to charge the same to Deposit Account 50-4402.

Respectfully submitted,

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